Installation Instructions
for Use by Heating Contractor

VIESMANN

Please file in Service Binder

Vitogas 100
GS1 Series
Natural gas-/propane-fired, single-stage
atmospheric cast-iron boiler

Heating input 90 to 240 MBH
26 to 70 kW

VITOGAS 100

IMPORTANT

Read and save these instructions for future reference.

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Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual can cause **product/property damage**, **severe personal injury**, and/or **loss of life**. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

■ **Licensed professional heating contractor**
The installation, adjustment, service, and maintenance of this equipment *must be* performed by a licensed professional heating contractor.

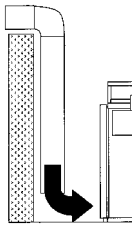
► *Please see section entitled "Important Regulatory and Installation Requirements".*

■ **Contaminated air**
Air contaminated by chemicals can cause by-products in the combustion process which are *poisonous* to inhabitants and destructive to Viessmann equipment.

► *For a listing of chemicals which cannot be stored in or near the boiler room, please see section entitled "Combustion Air Supply".*

■ **Fresh air**
This equipment requires fresh air for safe operation and must be installed ensuring provisions for *adequate combustion* and *ventilation air* exist.

► *For information pertaining to the fresh air requirements of this product, please see section entitled "Combustion Air Supply".*



■ **Product documentation**
Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

► *For a listing of applicable literature, please see section entitled "Important Regulatory and Installation Requirements".*

■ **Carbon monoxide**
Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain *poisonous* carbon monoxide gas.

► *For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see sections entitled "Combustion Air Supply" and "Venting Connection".*

■ **Equipment venting**
Never operate boiler without an *installed venting system*. An improper venting system can cause carbon monoxide poisoning.

► *For information pertaining to venting and chimney requirements, please see section entitled "Venting Connection". All products of combustion must be safely vented to the outdoors.*

■ **Advice to owner**
Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually before the heating season begins.

⚠ WARNING

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow manufacturer's maintenance schedule of boiler.

■ **Warranty**
Information contained in this and related product documentation must be read and followed. *Failure to do so renders warranty null and void.*

⚠ Warning

This boiler requires fresh air for safe operation and **must** be installed with provisions for adequate combustion and ventilation air (in accordance with local codes and regulations of authorities having jurisdiction).

Do not operate this boiler in areas with contaminated combustion air. High levels of contaminants such as drywall dust, lint or chemicals can be found at construction sites, home renovations, in garages, workshops, in dry cleaning/laundry facilities, near swimming pools and in manufacturing facilities.

Contaminated combustion air **will damage** the boiler and may lead to substantial property damage, severe personal injury and/or death. Ensure boiler/burner is inspected and serviced by a qualified heating contractor at least once a year in accordance with the Start-up/Service Instructions of the boiler.

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Important Regulatory and Installation Requirements

Codes
The installation of this unit shall be in accordance with local codes or, in the absence of local codes, use CAN/CSA-B149.1 or .2 Installation Codes for Gas Burning Appliances for Canada. For U.S. installations use the National Fuel Gas Code ANSI Z223.1. Always use latest editions of codes.

All electrical wiring is to be done in accordance with the latest edition of CSA C22.1 Part 1 and/or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70.
The heating contractor must also comply with the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1 where required by the authority having jurisdiction.

→ *Please carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed.*

For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

We offer frequent installation and service seminars to familiarize our partners with our products. Please inquire.

Mechanical room
Ensure the mechanical room complies with the requirements of the System Design Guideline and/or Technical Data Manual. In addition, see section entitled Mechanical Room in this manual.

Working on the equipment
The installation, adjustment, service, and maintenance of this boiler must be done by a **licensed professional heating contractor** who is qualified and experienced in the installation, service, and maintenance of hot water boilers. There are no user serviceable parts on the boiler, burners, or control.

Ensure **main power** supply to equipment, the heating system, and all external controls has been **deactivated**. **Close** main **gas supply valve**. Take precautions in both instances to avoid accidental activation of power during service work.

→ *The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. These include low-water cut-offs, flow switches (if used), staging controls, pumps, motorized valves, air vents, thermostats, etc.*

Technical literature
Literature applicable to the Vitogas boiler:
- Technical Data Manual
- Installation Instructions
- Start-up/Service Instructions
- Operating Instructions and User's Information Manual
- Instructions of other Viessmann products utilized and installed
- Installation codes mentioned in this manual

→ *Leave all literature at the installation site and advise the system operator/ultimate owner where the literature can be found. Contact Viessmann for additional copies.*

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Safety, Installation and Warranty Requirements *(continued)*

Fiberglass wool and ceramic fiber materials

WARNING

Inhalation of fiberglass wool and/or ceramic fiber materials is a possible cancer hazard. These materials can also cause respiratory, skin and eye irritation.

The state of California has listed the airborne fibers of these materials as a possible cancer hazard through inhalation. When handling these materials, special care must be applied.

Suppliers of ceramic fiber products recommend the following first aid measures:

- *Respiratory tract (nose and throat) irritation*
  If respiratory tract irritation develops, move the person to a dust free location.
- *Eye irritation*
  If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes.
- *Skin irritation*
  If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.
- *Gastrointestinal irritation*
  If gastrointestinal tract irritation develops, move the person to a dust free environment.

Suppliers of fiberglass wool products recommend the following precautions be taken when handling these materials:

Precautionary measures

- Avoid breathing fiberglass dust and contact with skin and eyes.
- Use NIOSH approved dust/mist respirator.
- Wear long-sleeved, loose fitting clothing, gloves and eye protection.
- Wash work clothes separately from other clothing. Rinse washer thoroughly.
- Operations such as sawing, blowing, tearout and spraying may generate airborne fiber concentration requiring additional protection.

First aid measures

- If eye contact occurs, flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- If skin contact occurs, wash affected areas gently with soap and warm water after handling.

Hazardous materials

WARNING

Appliance materials of construction, products of combustion and the fuel contain alumina, silica, heavy metals, carbon monoxide, nitrogen oxides, aldehydes and/or other toxic or harmful substances which can cause serious injury or loss of life and which are known to the State of California to cause cancer, birth defects and other reproductive harm. Always use proper safety clothing, respirators and equipment when servicing or working nearby the appliance.

About these Installation Instructions

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product/property damage.

→ *Warnings draw your attention to the presence of potential hazards or important product information.*

CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

→ *Cautions draw your attention to the presence of potential hazards or important product information.*

IMPORTANT

→ *Helpful hints for installation, operation or maintenance which pertain to the product.*

→

→ *This symbol indicates that additional, pertinent information is to be found in column three.*

→ *This symbol indicates that other instructions must be referenced.*

Product Information

CAUTION

Vitogas 100, GS1 boilers for use with propane gas are constructed with different orifices, gas valves, and other components unique for operation with propane gas.

Specify gas type at time of order. Use only the fuel stated on boiler rating plate.

Sectional cast-iron boiler with atmospheric, fully pre-mix burner.

For operation with modulating boiler water temperatures in closed loop, forced circulation hot water heating systems.

The Vitogas 100, GS1 Series is factory-calibrated for use with natural gas or propane gas. Order appropriately.

The boiler model size selected should be based on an accurate heat loss calculation of the building. The boiler selected must be compatible with the connected radiation.

Mechanical Room

During the early stages of new home design, we recommend that proper consideration be given to constructing a separate mechanical room dedicated to gas- or oil-fired equipment including domestic hot water storage tanks.

The boiler must be located in a heated indoor space, near a floor drain, and as close as possible to the vertical chimney or vent.

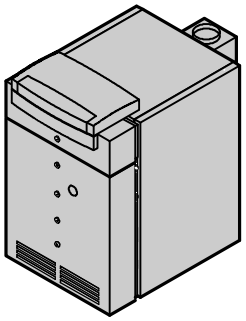
Whenever possible install boiler near an outside wall so that it is easy to duct fresh air directly to the boiler area. In addition, do not use exhaust fans in the boiler room and do not install the boiler in rooms with refrigeration equipment. This equipment requires uncontaminated outside air for safe operation - do not install where chemicals are stored or in a room with negative pressure. See section entitled "Combustion Air Supply" for further details regarding the above.

Locate boiler on flooring capable of supporting the weight of the boiler filled with water. Ensure that the boiler location does not interfere with the proper circulation of combustion and ventilation air within the mechanical room.

The maximum room temperature of the mechanical room where the boiler is located must not exceed 95°F / 35°C.

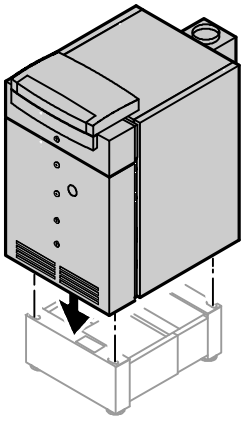
Product Installation Alternatives

Installation without boiler stand



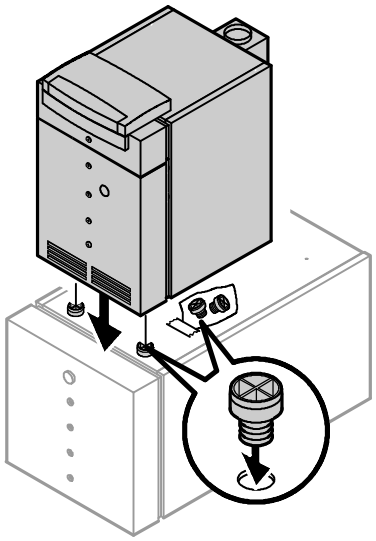
Instructions provided in this manual

Installation with boiler stand



Installation Instructions Boiler Stand

Installation on Vitocell tank



Installation Instructions Domestic Hot Water Tank and Installation Instruction Supplement supplied with the tank.

Before Set-up

Before placing boiler in its installation location, ensure all necessary accessories (e.g. boiler stand) are installed.

IMPORTANT

Do not use draft hood or boiler enclosure paneling to lift/move boiler into its installation location.

CAUTION

The boiler must be installed in such a way that gas ignition system components are protected from water (spraying, splashing, etc.) during boiler system operation and service.

Installation Instructions Boiler Stand

Minimum Clearances

Recommended minimum clearances for service

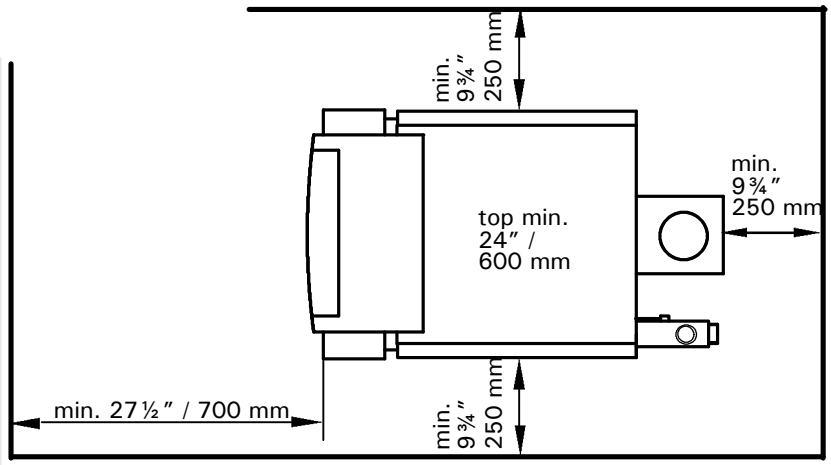


Diagram is not to scale.

When the Divicon pre-assembled mixing valve station is installed the minimum distance beside the boiler must be 19¾" / 500 mm

There must be sufficient space for a heating contractor to access the rear of the boiler to inspect the blocked vent switch.

Minimum Clearances

Recommended minimum clearances to combustibles

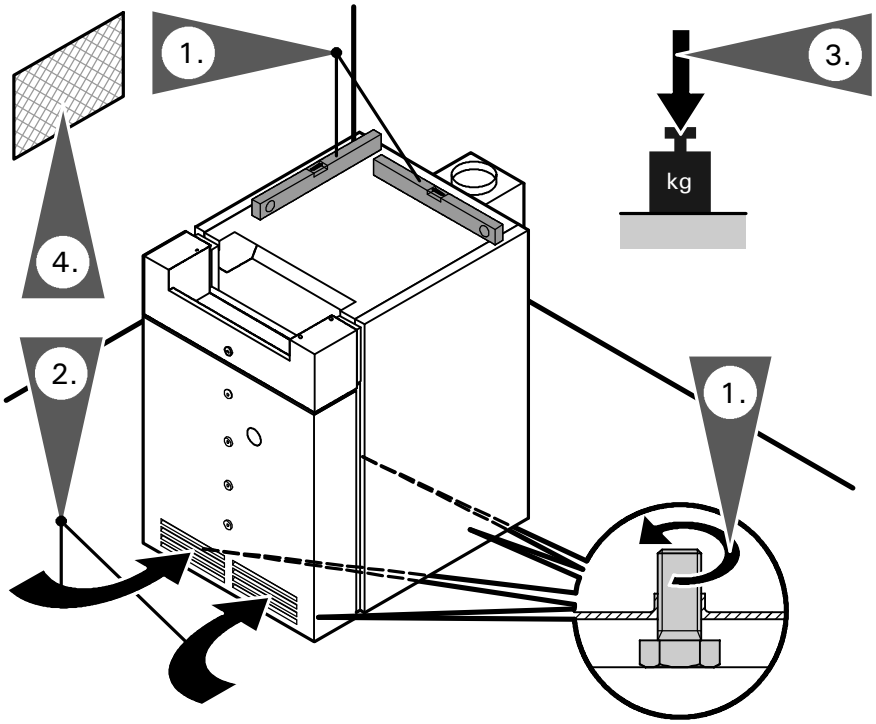
For typical installations, Viessmann recommends installing the boiler with clearances as published on the previous page in subsection entitled "Recommended minimum clearances for service".

The Vitogas 100, GS1 boiler is approved for closet and alcove installations with the following clearances to combustibles:

Boiler Model	GS1	-22	-29	-35	-42	-48	-60
Rear (from draft hood)	inches	6	6	6	6	6	6
	mm	150	150	150	150	150	150
Sides	inches	0	0	0	0	0	0
	mm	0	0	0	0	0	0
Flue	inches	6	6	6	6	6	6
	mm	150	150	150	150	150	150
Top	inches	6	6	6	6	6	6
	mm	150	150	150	150	150	150
Floor		Combustibles					

All clearances are measured from boiler enclosure.

Boiler Set-up and Orientation



For Vitogas 100, GS1 installations on a Vitocell tank, reference the Installation Instruction Supplement supplied with the tank.

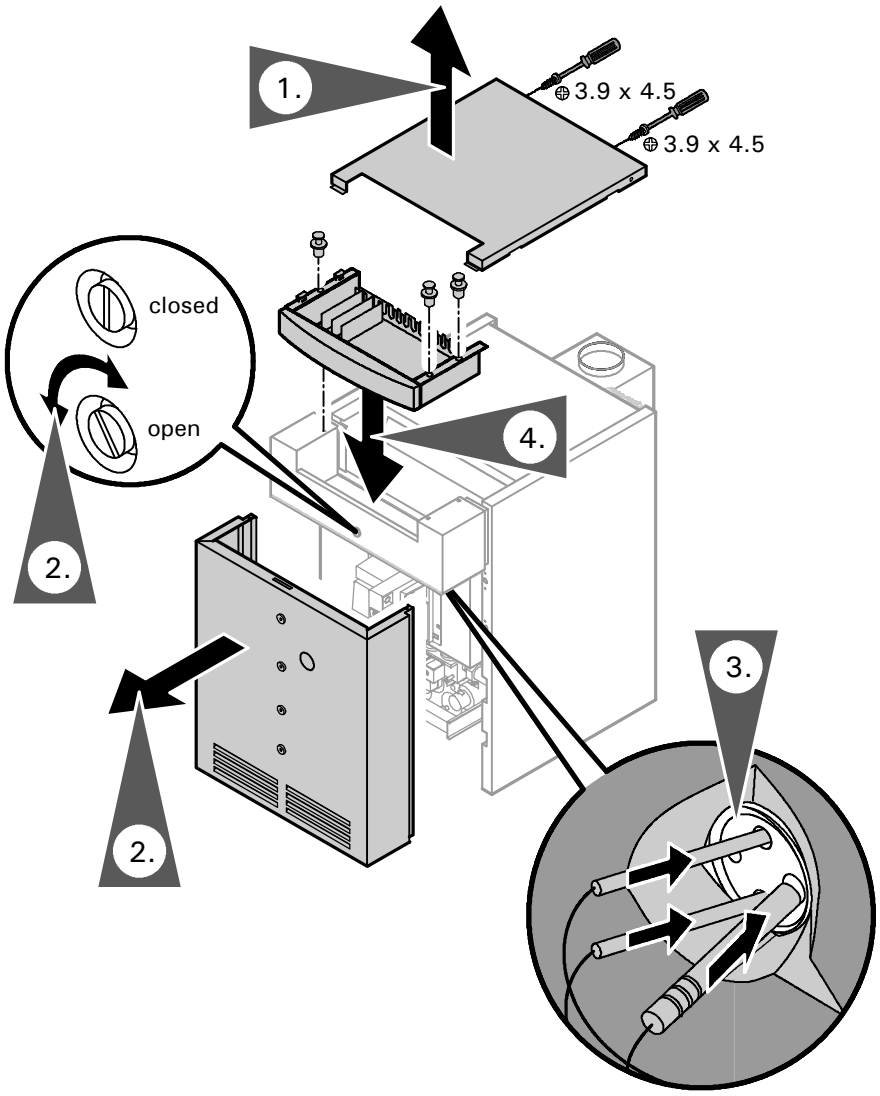
1. Move boiler as close as possible to chimney and set up using leveling bolts. Use a level to ensure boiler is level.
A special boiler base/foundation is not necessary.

2. Ensure air flow to front and rear of boiler is not restricted in any way.

3. Ensure compliance with local codes where wood flooring or flooring other than concrete is present.

4. Ensure fresh air intake is not located too close to the burner to avoid drafts which may cause abnormal burner operation.

Boiler Control Base Installation



1. Loosen screws and remove top panel.

2. Unlock front panel and remove.

3. Carefully push high limits and boiler temperature sensor [3] into sensor wells as far as possible.

IMPORTANT

Boiler temperature sensor [3] is shipped with the boiler control.

Lay excess sensor cabling and capillary tubing on insulation.

WARNING

Do not kink capillaries. Proper operation of sensors is not possible if capillaries are kinked.

4. Insert boiler control base into upper front panel. Fasten with supplied rivets (shipped with boiler control).

Electrical Connections

All electrical wiring is to be done in accordance with the latest editions of CSA C22.1 Part 1 and/or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70.

See wiring diagram label on boiler. Viessmann reserves the right to substitute electrical components as necessary.

Before attempting to wire the unit, ensure **main power** supply to equipment, the heating system, and all external controls has been **deactivated**. **Close** main **gas supply valve**.

Take precautions in all instances to avoid accidental activation of power during service work.

All wiring must be properly grounded. A dedicated ground wire must be run from the boiler to the service panel.

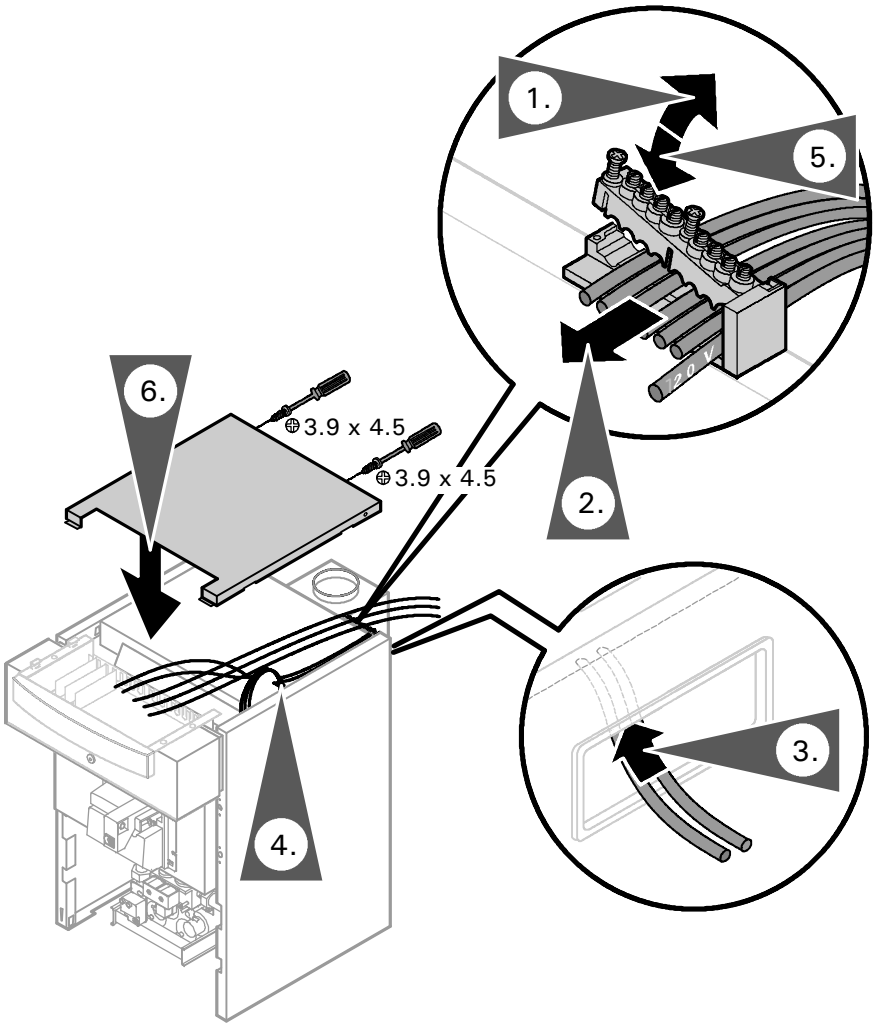
Boiler electrical requirements are 120 VAC, 60 Hz, less than 15 A.

WARNING

The boiler must be grounded in accordance with the latest edition of ANSI/NFPA 70. In Canada use CSA C22.1. Do not rely on piping to ground the boiler. Service personnel standing in wet areas may be electrocuted by an ungrounded boiler.

Electrical Connections *(continued)*

Boiler wiring



For detailed information regarding connections on control base, see Installation Instructions for Boiler Control.

IMPORTANT

The power supply cable is shipped with the boiler control.

1. Open strain reliefs located on rear panel.
2. Channel power supply cable or Power/Pump Module cable (for Vitotronic 200/300) and all other 120 VAC cabling through strain reliefs toward the boiler control.
3. Channel low voltage cables (i.e. sensor cables) through cable opening toward boiler control.
4. For vent damper installations the boiler is shipped with a 10 ft. / 24 V vent damper cable. The female end of the Molex connector of the vent damper with the strain relief comes factory channeled through the cable opening.
5. Coil excess cabling and tuck between side panel and insulation.
6. Close strain relief and tighten screws.
7. Mount top panel and fasten using screws.

WARNING

Do not allow any electrical wires or conduits to touch the draft hood, vent pipe, or water piping.

WARNING

Always route all cables and capillaries between nylon-backed insulation and metal enclosure panels. Never allow cables and capillaries to come in direct contact with metal pressure vessel!

Venting Connection

Safety inspection of existing venting system

When existing boiler is removed from a common venting system, the common venting is likely to be too large for proper venting of the appliances remaining connected to it.

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation:

- Seal any unused openings in the common venting system.
- Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion, or any other deficiency which could cause an unsafe condition.
- Insofar as is practical, close all building doors and windows, and all doors between the space in which the appliances remain connected to the common venting system, and other spaces of the building. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
- Place in operation the appliance being inspected. Follow the Lighting and Operating Instructions. Adjust thermostat so appliance will operate continuously.
- Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or a candle.
- After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, as well as any other gas burning appliance to their previous condition of use.
- Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1 latest edition. When resizing, any portion of the common venting system should be resized to approach the minimum size as determined, using the appropriate tables in the National Fuel Gas Code, ANSI Z223.1 latest edition.

⚠ WARNING

Improper sizing, maintenance, termination of vent or chimney can cause flue gases to enter living space. Any blockage of vent or chimney by birds' nests, ice, snow, debris, or other materials can cause flue gases to enter living space. Flue gases entering living space can cause carbon monoxide poisoning which can result in severe personal injury or loss of life.

Installation of boiler venting

The boiler should be located as close to the chimney as possible. The vent connection must be made in the shortest possible way with minimum elbows. If necessary, rearrange existing water piping to achieve closest chimney connection.

When the vertical pipe becomes the chimney itself, the weight must not be supported by the horizontal to vertical draft hood on the boiler.

Avoid long horizontal runs of vent pipe. Horizontal runs must be supported by appropriate means to prevent sagging. Horizontal runs should have no less than ¼" rise per ft. from the boiler to the vent terminal and must be properly insulated to reduce cooling of flue gas.

Metal strapping must be used to support horizontal runs every 4 ft. / 1.2 m.

Use approved vent material only.

The vent connector of this boiler must not be connected into any portion of mechanical draft systems operating under positive pressure.

Based upon proper chimney and breeching size, the boiler may be vented into a chimney/breeching with a direct-fired (atmospheric-fired) gas water heater. Observe national codes, local rules and regulations.

Terminate venting system outside with approved termination at least 6 ft. / 1.8 m above boiler. Vent pipe must extend at least 3 ft. / 0.9 m above the point where it passes through the roof. Vent termination must be at least 2 ft. / 0.6 m higher than any portion of the building within 10 ft. / 3 m horizontal, and vent termination must be at least 2 ft. / 0.6 m higher than roof peaks within 10 ft. / 3 m horizontal.

Down draft and condensation problems must be corrected.

Installation of side wall vent system

A side wall power vent system can be ordered from Viessmann. This package includes the appropriate power venter, vent terminal, and adaptor fittings for each Vitogas 100, GS1 boiler model, as well as installation instructions.

The vent system must terminate so that proper clearances are maintained as cited in the National Fuel Gas Code, ANSI Z223.1 and as detailed in the Side Wall Vent System Installation Instructions. Observe and follow these instructions carefully.

⚠ WARNING

When the side wall vent system is used, the vent damper MUST NOT be installed.

Venting Connection *(continued)*

Chimney

A corrosion-resistant approved liner must be installed in masonry or unlined chimneys. The liner should be insulated to prevent condensation of flue gas in cold weather.

Before connection boiler to existing chimney, inspect chimney for inside and outside conditions. Repair or replace immediately if any leaks or other defects are found in the vent system.

To avoid chimney condensation, proper consideration must be given to shortest possible vent connection, type of vent, and chimney size.

In replacement installations where the previous boiler experienced chimney or vent condensation problems, the Vitogas 100, GS1 must be installed as close as possible to the vertical chimney (relocate water piping if necessary), and the liner must be insulated. These measures will help reduce the likelihood of chimney or vent flue gas condensation.

Refer to natural draft venting tables in CSA B149.1 and .2 (Canada) and ANSI Z223.1 (USA) for every installation for proper vent diameter. Depending on the lateral and vertical vent lengths, the vent diameter may have to be increased to a size larger than the vent connector on the draft hood.

Some retrofit installations may require an engineered vent system specific to the project site.

If chimney is of multi-fuel design, ensure local codes permit its use with the Vitogas 100, GS1 boiler. Ensure correct flue is chosen for the flue connection of the boiler.

Blocked vent and flame roll-out safety switch

The blocked vent switch is located at the back of the boiler in the draft hood. In the event of a complete vent blockage, the spill switch heats up and interrupts 24 V to the gas control shutting down the burner. The switch requires a manual reset by pushing in the red button. If the switch activates, the vent system must be checked inside and out and the blockage or defect corrected by a qualified heating contractor before boiler is put back in operation.

The flame roll-out switch is located in the burner area. In the event of blockage of the cast-iron flue ways inside the boiler, hot gases will cause the switch to open, shutting down the burner. The heat exchanger must be thoroughly examined and cleaned by a qualified heating contractor before the boiler is put back into operation. The switch requires a manual reset by pushing the red button when the switch has sufficiently cooled.

IMPORTANT

In either of the above functions, do not operate the boiler without the blocked vent or flame roll-out safety switch(es). Advise the system operator/ultimate owner to contact a qualified heating contractor for service immediately.

IMPORTANT

When installing piping or venting, or while insulating overhead pipes, do not stand on top panel of boiler. Advise other trades accordingly!

Vitogas
Never operate the boiler without an installed venting system which safely vents all products of combustion to the outdoors. The vent system must comply with all applicable local and/or national codes.

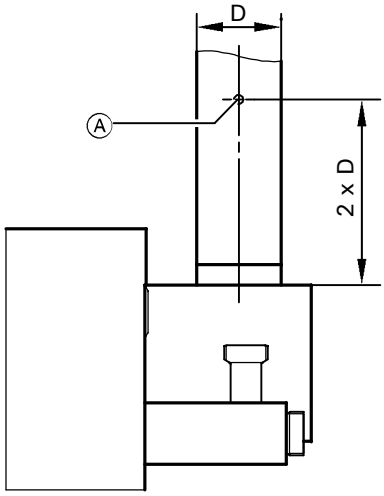
Vitogas boilers are Category I boilers as defined in ANSI Z21.13. Boiler category does not apply when boiler is vented through the wall with optional power venter.

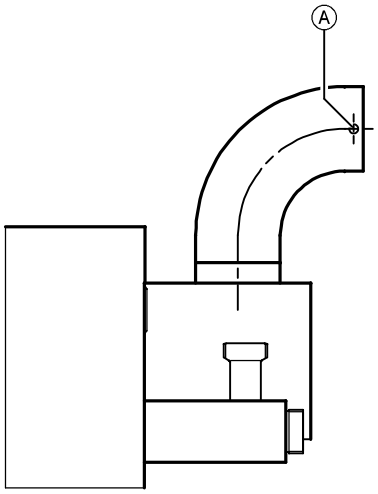
The boiler draft hood must not be altered or modified in the field.

In Canada
For gas boilers install venting system in accordance with all applicable local codes. In the absence of local codes, follow national codes CAN/CSA B149.1 or .2.

In U.S.A.
For boilers for connection to gas vents or chimneys, vent installations shall be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1 or applicable provisions of the local building codes.

Venting Connection *(continued)*





Ⓐ Combustion test opening ∅½″

IMPORTANT

Do not run vent connector along outside wall.

IMPORTANT

The diameter of the vent pipe must be identical to the diameter of the draft hood chimney connection.

Installation

1. Install the venting so as to achieve the shortest possible way with minimum elbows. If necessary, rearrange existing water piping to achieve closest chimney connection.

2. Horizontal runs must be supported by appropriate means to prevent sagging. Avoid long horizontal runs of vent pipe. Horizontal runs should have no less than ¼″ rise per ft. from the boiler to the vent terminal. Metal strapping must be used to support horizontal runs every 4 ft. / 1.2 m.

3. Fasten sheet metal vent pipe adaptor supplied with boiler (if applicable) to the draft hood flue collar. Use high temperature silicone to seal between sheet metal adaptor and boiler draft hood connection. Drill pilot holes with 11/64″ cobalt HSS drill bit and fasten using three equally spaced screws. Vent pipe adaptors are shipped in the Installation Fitting Package.

⚠ WARNING

Failure to securely fasten all vent connections, including vent pipe adaptor to boiler, can cause flue gases to enter living space. Flue gases leaking into living space can cause carbon monoxide poisoning which may result in severe personal injury or loss of life.

4. Connect vent pipe adaptor with chimney via a field supplied, slightly inclined intermediate section of venting. Draft hood flue pipe diameter:
   GS1-22 ..... Outside ∅ 5″
   GS1-29 to -42 ..... Outside ∅ 6″
   GS1-48 to -60 ..... Outside ∅ 7″

5. Drill a ½″ opening Ⓐ on the side of the vent pipe approximately two times the vent pipe diameter away from the flue gas collar of the boiler for flue gas analysis equipment.

6. It is recommended to seal all flue pipe joints.

7. Ensure any non-insulated vent pipe is insulated to reduce cooling of flue gas.

Venting Connection *(continued)*

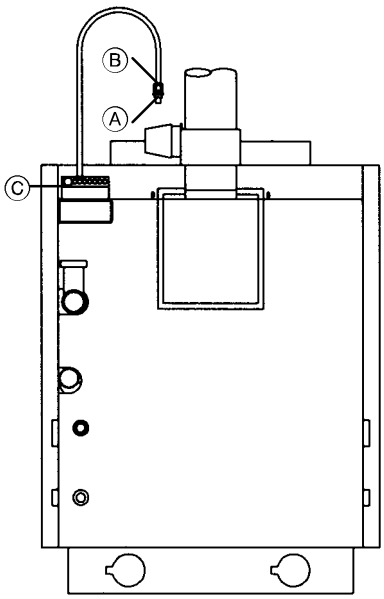
Vent damper installation

If boiler is sold with a vent damper (packaged separately), the vent damper must be installed on the boiler to meet minimum efficiency standards.

The vent damper must be field installed on the boiler. Read the vent damper manufacturer's instructions before installing the vent damper.

The closing and opening action of the vent damper is driven by a motor. Spring action is not used to move the vent damper blade. Do not force vent damper blade by hand. Forcing the vent damper blade by hand will damage the motor. To observe the vent damper blade movement, turn thermostat up and down after vent damper has been installed. Vent damper blade must be in open position when burner is firing.

The vent damper must be installed as illustrated below. Ensure that damper blade rotates freely and is not obstructed in any way. Read and save the vent damper manufacturer's instructions packaged with the vent damper.



Ⓐ Molex connector
Ⓑ Strain relief
Ⓒ Boiler strain relief openings

1. Review step 4 in subsection entitled "Boiler wiring" on page 11.

2. Attach Molex female connector of vent damper cable to counter male connector on vent damper motor. Use supplied plastic strain relief on vent damper cable and metallic strain relief on vent damper motor to secure the cable.

There are no serviceable parts on the vent damper. Defective vent dampers must be replaced.

If a side wall vent system is used, the vent damper must not be installed. Refer to separate side wall vent system instructions for series boiler. The side wall vent system must be purchased separately.

Sequence of operation with vent damper:

1. Thermostat calls for heat.

2. Vent damper blade opens.

3. Pilot sparks and ignites.

4. Pilot is proven and main valve is energized.

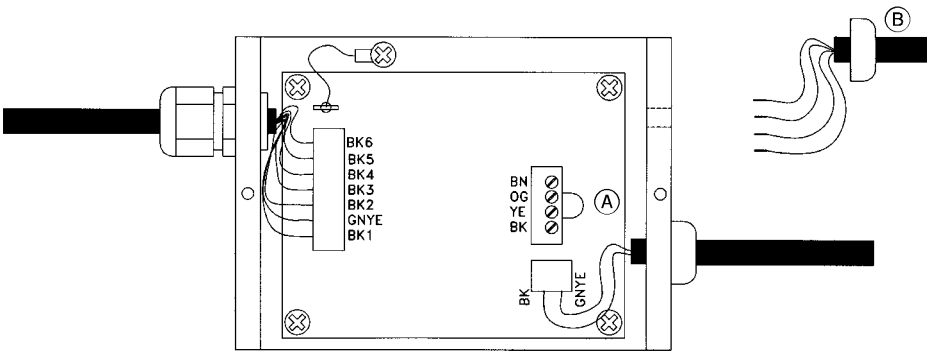
5. Main burner and pilot will continue to operate until thermostat is satisfied. Burner may turn off and on in response to the adjustable high limit aquastat setting during call for heat.

Should the vent damper become defective:

1. Follow the vent damper manufacturer's instructions to leave the vent damper in the "Service" or "Hold Open Damper" (Effikal) mode by using the service switch on the damper motor. Vent damper blade should stay open and boiler should operate normally.

2. If the procedure described above does not work, remove vent damper, install transitional piece of vent pipe, disconnect and remove vent damper cable from the 120 V / 24 V relay module assembly. Connect jumper to terminals 2 (orange) and 3 (yellow) as illustrated below. Refer to wiring diagrams. Boiler will operate without vent damper.

Please note:
The "Effikal" damper can be field replaced with a similar size "Field Controls" damper.



Ⓐ Jumper connected to terminals 2 and 3
Ⓑ Removed vent damper cable

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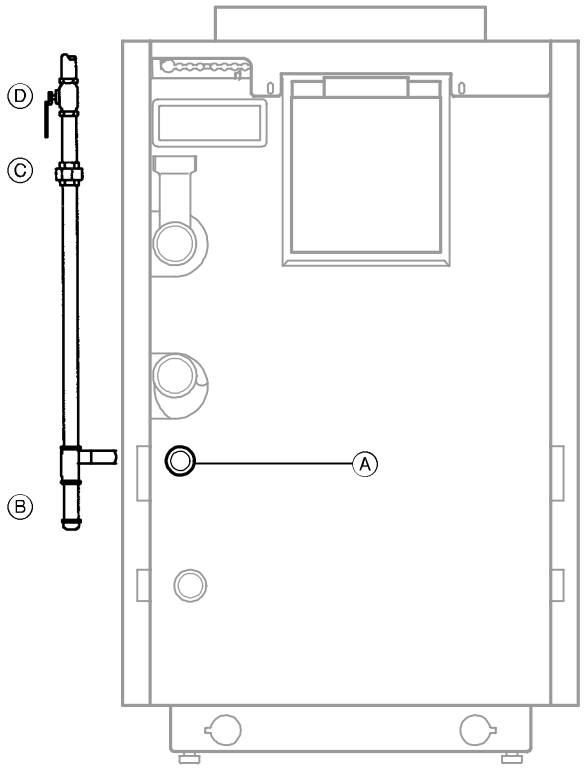
Gas Connection and Piping



Ⓐ Gas connection
Ⓑ Drip leg
Ⓒ Ground joint union
Ⓓ Approved manual gas shut-off valve

1. Size and connect gas supply piping in accordance with local and national codes.

2. Before connecting boiler to gas line, install main gas shut-off valve, ground joint union, and capped drip leg. Connect boiler gas connection to the above.

   Gas connection (NPT) ..... ∅ 1/2"

3. Perform gas piping pressure test. See section below
   .

⚠ WARNING

The gas supply piping must be leak tested before placing the boiler in operation.

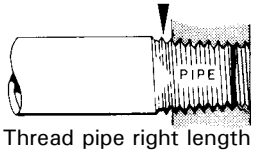
4. Identify the main shut-off valve as such with a tag and familiarize operator/ultimate owner of boiler with this valve.

IMPORTANT

Max. gas supply pressure: 14 "w.c.

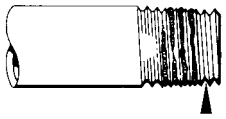
Proper piping practice

2 imperfect threads



Thread pipe right length

Use moderate amount of dope



Leave 2 end threads bare

Support piping by proper suspension method. Piping must not rest on or be supported by boiler.

Gas piping pressure test

Perform gas piping pressure test. Ensure the following requirements are met:

1. Isolate the boiler from the gas supply piping system using the individual manual shut-off valve during pressure tests equal to or less than ½ psig / 14" w.c..
2. The boiler and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of ½ psig / 14" w.c..
3. Unions and gas manifold have been factory-tested. Leak test must be repeated during initial trial operation of burner by a licensed gas fitter.
4. Perform leak test.
   Use approved liquid spray solution for bubble test. Ensure than no liquid is sprayed on any electrical components, wires or connectors. Do **not** allow leak detection fluid to contact gas valve regulator or regulator vent opening.

⚠ WARNING

Never check for gas leaks with an open flame.

5. Correct any and all deficiencies.
6. Remove air from gas line.

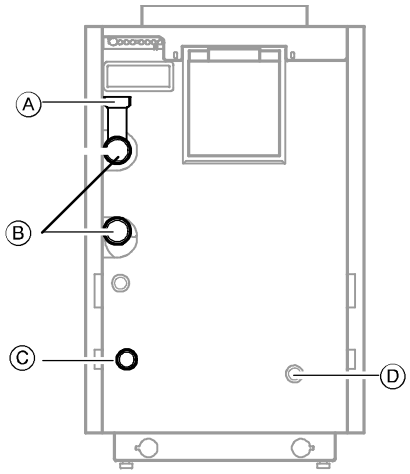
⚠ WARNING

Exposing boiler gas pressure regulator and gas valve to extreme pressures renders warranty null and void.

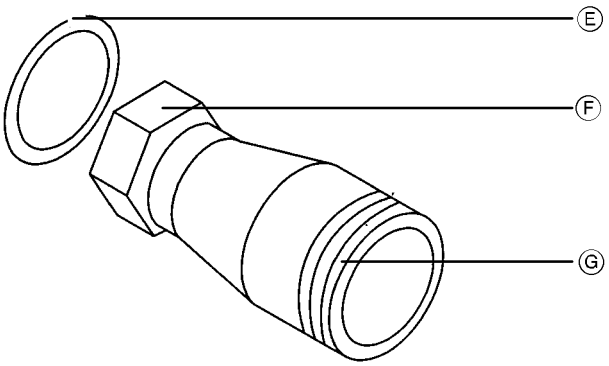
IMPORTANT

½ psig = 14 "w.c.

Water Side Connections



Ⓐ Safety supply, for pressure relief valve and air vent (non-NPT) ..... ∅ 1 1/2"
Ⓑ Boiler water supply and return (non-NPT) ..... ∅ 1 1/2"
Ⓒ Boiler drain, for precharged expansion tank and automatic feed (NPT) ..... ∅ ¾"
Ⓓ Drain connection for left cast-iron section (located at boiler front)



Ⓔ Gasket
Ⓕ Connect this end using gasket to non-NPT threads of welded supply and return boiler nipples
Ⓖ 1 1/2" NPT male threads

⚠ CAUTION

The boiler warranty does not cover leaks resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier. Such systems must have the non-oxygen-diffusion barrier tubing separated from the boiler with a heat exchanger. Viessmann recommends the use of underfloor plastic tubing with an oxygen diffusion barrier.

Installation Instructions Divicon Station

IMPORTANT

This boiler is designed for closed loop, forced circulation heating systems only.

1. Flush heating system thoroughly (particularly existing systems which have been in operation for years).

⚠ CAUTION

Failure to flush the heating system could cause system sludge to settle in the boiler, causing overheating and failure. This type of failure is not covered under warranty.

2. Attach two 1½" NPT adaptors and gaskets (Installation Fittings Package) to the welded supply and return non-NPT nipples on boiler.
   Do **not** connect system piping directly to supply and return nipples.

3. Connect heating circuits.
   Do not connect the system return to the safety return Ⓒ.

IMPORTANT

We recommend the installation of a spring-loaded flow-check valve in heating circuits without mixing valves. This serves to avoid uncontrolled gravity circulation of heat into the heating system during prioritized DHW production, or during summer months.

⚠ CAUTION

To drain the boiler use drain connection on the back of the boiler first. Then use the front drain connection to drain the left cast-iron section.

Service Instructions Vitogas 100, GS1

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Safety Connections and Pressure Testing

Installation Instructions
Viessmann Safety Header
(accessory)

Installing safety devices on the boiler

Installing safety devices.

1. Install pressure relief valve, discharge pipe, air vent and pressure gage as described in installation instructions of Safety Header.
A 30 psig pressure relief valve is shipped with the boiler (standard equipment).

2. Install discharge pipe on pressure relief valve. The end of the pipe must **not** be threaded.

The pressure relief discharge pipe should extend to a floor drain and end approximately 6" / 150 mm above the drain.
Do **not** install shut-off valve in discharge pipe.
Do **not** reduce discharge pipe diameter.
Do **not** pipe discharge to outdoors!

Minimum connection diameters:

Pressure relief valve	$^3/_4$"
Discharge pipe	$^3/_4$"
Piping to precharged expansion tank	$^3/_4$"

IMPORTANT

Install the (approved) factory supplied pressure relief valve.

Removal of air from the system must occur via use of air vent(s) in the system supply. To ensure the boiler can be purged of all air, ensure supply/return water lines do not contain restrictive piping where air could be trapped.

WARNING

Do not install an isolation valve between boiler and pressure relief valve.
The discharge pipe for the pressure relief valve must be oriented to prevent scalding of attendants.
Pipe pressure relief valve discharge pipe close to floor drain. Never pipe discharge pipe to the outdoors.

IMPORTANT

This boiler does not require a flow switch.

Low water cut-off
A low water cut-off may be required by local codes. If boiler is installed above radiation level, a low water cut-off device of approved type (field supplied) must be installed in all instances. Do not install an isolation valve between boiler and low water cut-off.

Safety Connections and Pressure Testing *(continued)*

Performing pressure test on the boiler

The boiler must be leak tested before being placed in operation. Before boiler is connected to piping or electrical power supply, it must be hydrostatically pressure tested with a maximum of 1½ times the maximum operating pressure of the boiler.

1. After installing safety devices (see previous page), install temporary cap on ¾" nipple extension (nipple for pressure relief valve mounting).

2. Cap supply and return connections.

3. Connect ½" garden hose to boiler drain valve at the back of the boiler and fill boiler slowly until pressure gage indicates max. 90 psig / 620 kPa.

4. Maintain pressure for 15 minutes. During time of pressure testing, do not leave boiler unattended.

5. Inspect all pipe joint connections, the safety devices and boiler base with flashlight for leaks.

6. After 15 minutes, release water pressure from boiler by opening boiler drain valve slowly, remove caps from supply and return connections as well as ¾" cap from safety nipple, and install pressure relief valve immediately instead of ¾" cap.

   After boiler has passed pressure test, proceed with installation.

CAUTION

Do not use the front drain valve to fill the boiler.

WARNING

Exposing the boiler to pressures and temperatures in excess of those listed will result in damages, and will render warranty null and void.

Max. operating pressure ..... 60 psig / 413 kPa
Max. testing pressure ..... 90 psig / 620 kPa
Max. boiler temperature ..... 250 °F / 120 °C

DHW Side Connections

For the production of domestic hot water, the boiler must be connected to an indirect-fired domestic hot water storage tank. Contact Viessmann for control options. Water for domestic use must **not** be drawn from the boiler for any purpose. This boiler does **not** use a tankless coil.

Installation Instructions Domestic Hot Water Storage Tank

Installation Examples

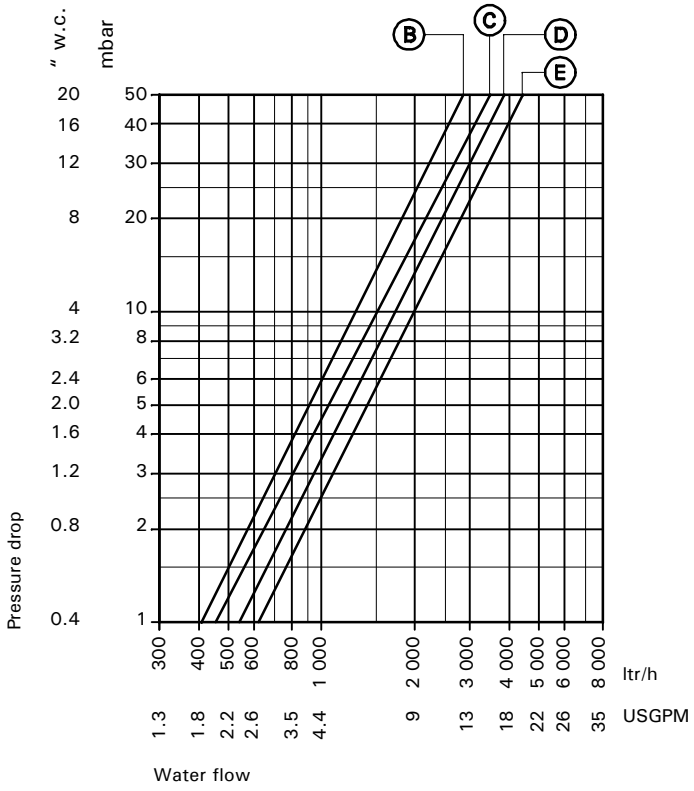
General
The schematics on the following pages are to be seen as guidelines only. They further do not display all system varieties, safety devices, or concepts possible. Specific system layouts may be further discussed with the local Viessmann sales representative office.

Clearances
A minimum of 2" circumferential clearance from non-insulated hot water pipes to combustible construction must be maintained. In cases where the pipes are insulated with pipe insulation of appropriate and sufficient thickness and insulation values, the above clearance may be reduced to 0" (refer to local gas codes).

CAUTION

For underfloor heating applications, an additional immersion or strap-on aquastat must be installed in the low temperature underfloor loop (ahead of the mixing valve) to de-energize the pump and/or boiler to prevent overheating. High water temperatures can damage concrete slabs.

Waterside flow



Ⓑ GS1-22
Ⓒ GS1-29
Ⓓ GS1-35 and -42
Ⓔ GS1-48 and -60

Flow rates
The relationship between boiler flow rate and temperature rise is according to the formula:

Boiler output (Btu/h) = 500 x flow (USGPM) x Rise (°F)

The following chart lists typical flow rates for the Vitogas 100, GS1 boiler:

Boiler Model	GS1	-22	-29	-35	-42	-48	-60
20°F rise	USGPM	7.5	9.8	12.3	14.0	16.1	24
	m^3/h	1.7	2.2	2.8	3.2	3.6	5.4
30°F rise	USGPM	5.0	6.5	8.2	9.3	10.7	16.0
	m^3/h	1.1	1.5	1.9	2.1	2.4	3.6

Installation Examples *(continued)*

Installation Examples

IMPORTANT

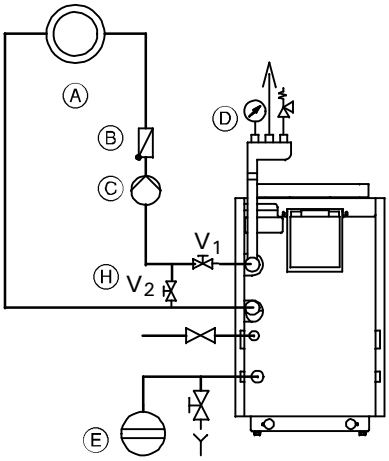
These examples show possible piping layouts for Viessmann product equipped with Viessmann System Technology. For boiler and tank combinations, please install only the feasible combinations listed in the Price List.

These are simplified conceptual drawings only! Piping and necessary componentry must be field verified.

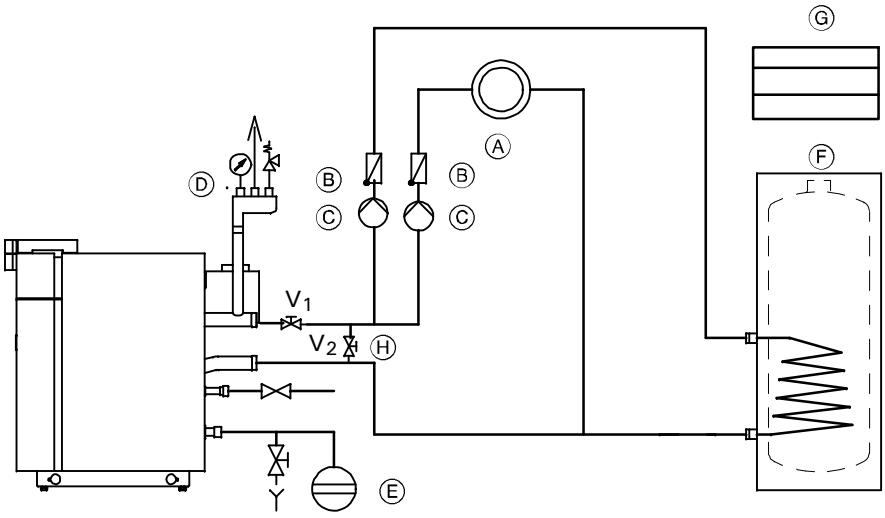
Proper installation and functionality in the field is the responsibility of the heating contractor.

Without mixing valve

e.g. with Vitotronic 100



The installation of the check valve to restrict gravity circulation in the heating supply pipe prevents uncontrolled heat flow to the heating system by gravity during priority switching of domestic hot water heating or during summer operation.



Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Safety header
with automatic air vent, pressure relief valve, and pressure gage
Ⓔ Expansion tank
Ⓕ Domestic hot water storage tank (indirect-fired)
Ⓖ DHW pump module
Ⓗ Bypass pipe (highly recommended) c/w two regulating valves (V_1, V_2)
See page 28 for installation details.

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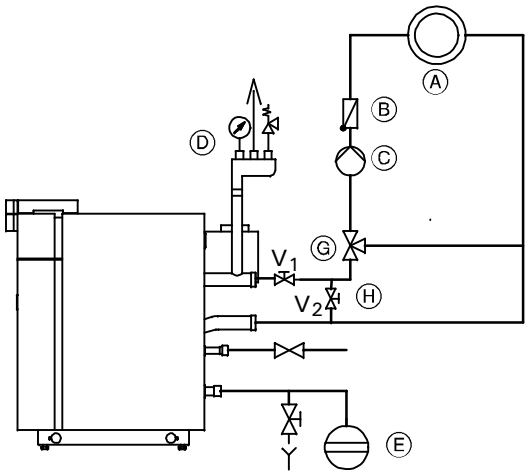
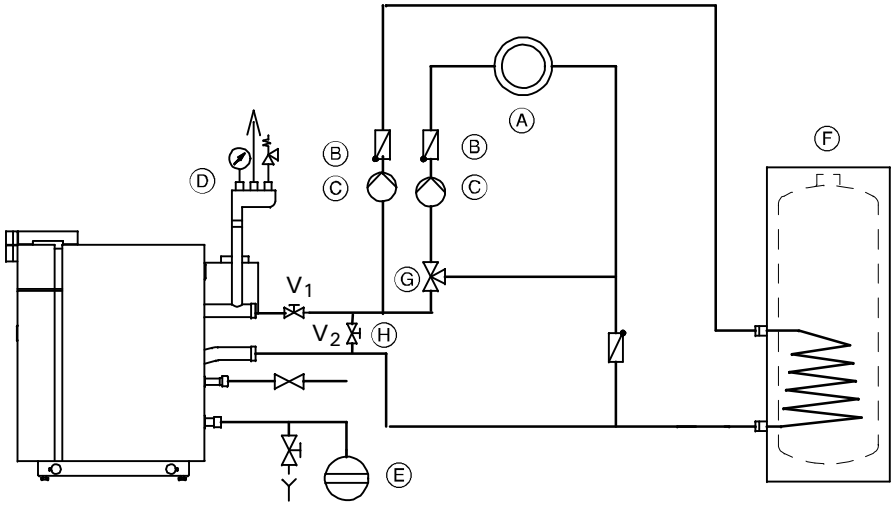
Installation Examples *(continued)*

With 3-way mixing valve to regulate heating circuit
e.g. with Vitotronic 200, KW2 combined with a mixing valve actuator accessory kit

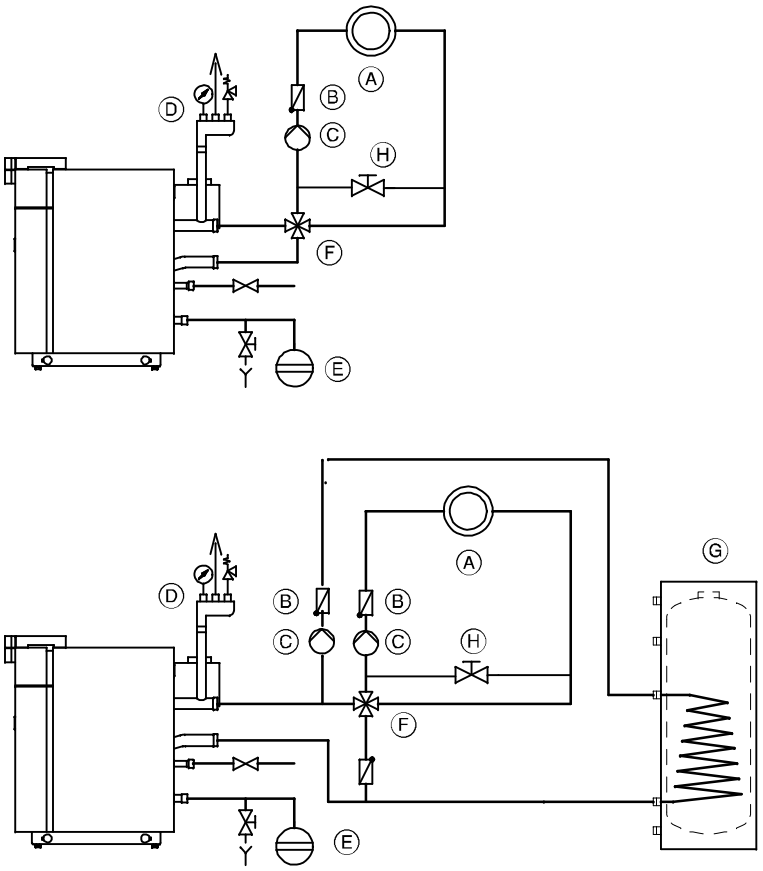




Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Safety header
with automatic air vent,
pressure relief valve, and
pressure gage
Ⓔ Expansion tank
Ⓕ Domestic hot water storage tank
(indirect-fired)
Ⓖ 3-way mixing valve
Ⓗ Bypass pipe (highly recommended)
c/w two regulating valves (V_1, V_2)
See page 28 for installation details.

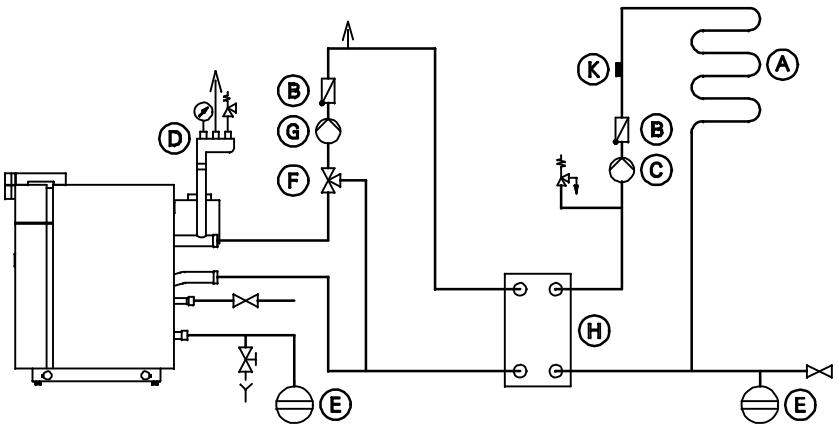
Installation Examples *(continued)*

With 4-way mixing valve to regulate heating circuit
e.g. with Vitotronic 200, KW2 combined with a mixing valve actuator accessory kit



Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Safety header
with automatic air vent, pressure relief valve, and pressure gage
Ⓔ Expansion tank
Ⓕ 4-way mixing valve
Ⓖ Domestic hot water tank (indirect-fired)
Ⓗ Bypass pipe with flow regulating valve, for systems with large water content (>1 USG/13 000 Btu/h / 15 ltr/kW/h of boiler input).
See page 28 for installation details.

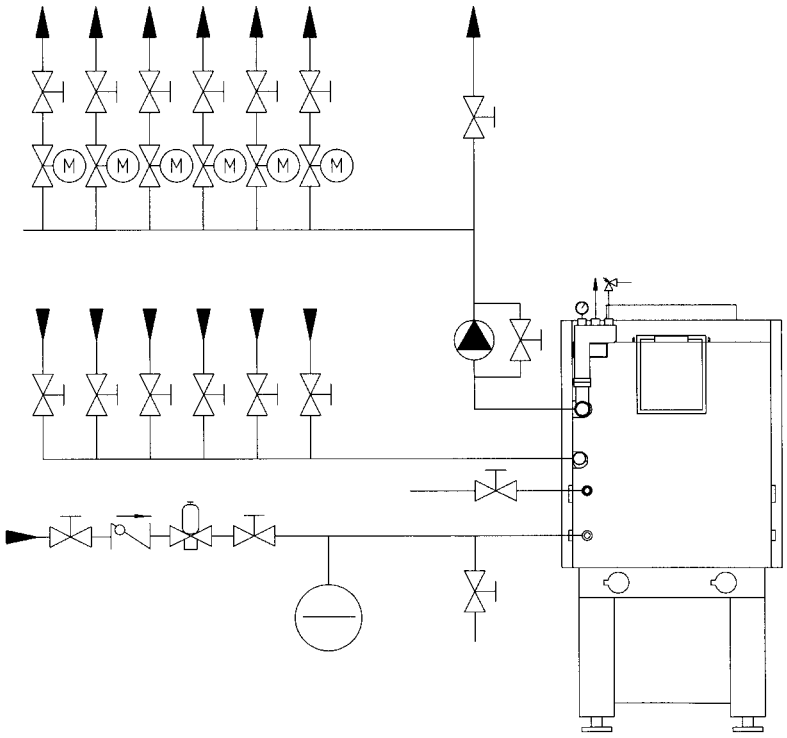
Underfloor heating system with system separation



Ⓐ Underfloor heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump for underfloor heating circuit
Ⓓ Safety header
with automatic air vent, pressure relief valve, and pressure gage
Ⓔ Expansion tank
Ⓕ 3-way mixing valve
Ⓖ Circulation pump for heat exchanger
Ⓗ Heat exchanger
Ⓚ Supply temperature sensor

Installation Examples *(continued)*

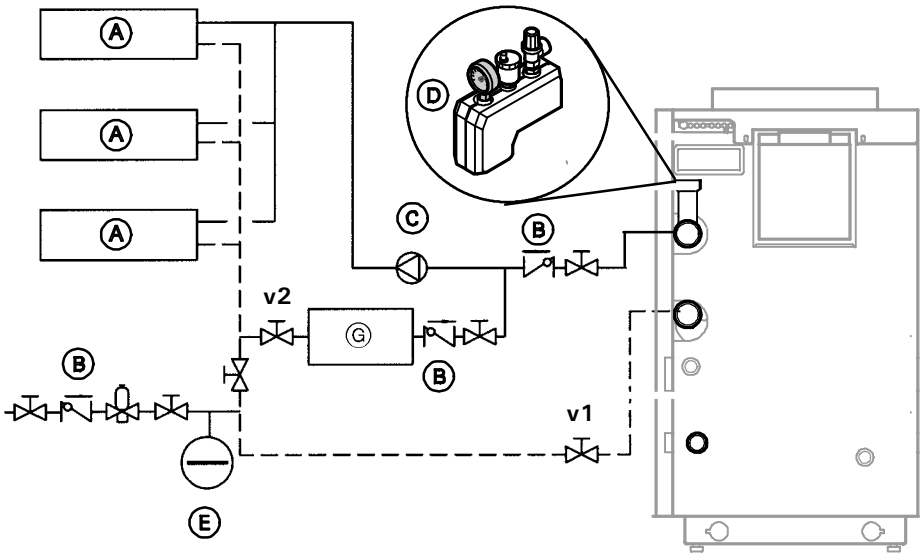
System with multiple zones



If system has motorized zone valves and single circulating pump installed, operate pump continuously and install pressure by-pass around pump. Operate zone valves on/off by individual room thermostats only. Do not connect end switches to burner since overheating of boiler may occur. Control boiler/burner independently by an additional operating control. See illustration on the left.

Installation Examples *(continued)*

Boiler in a heating/cooling application



The boiler, when used in connection with a refrigeration system, must be installed ensuring the chilled medium is piped in parallel to the boiler with appropriate valves to prevent the chilled medium from entering the boiler. See illustration on the left.

The boiler piping system of a hot water heating boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

Check installation instructions of the chiller manufacturer carefully for additional requirements.

Cooling season starts:
close valve v1 and open valve v2

Heating season starts:
close valve v2 and open valve v1

Ⓐ Heating/Cooling unit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Safety header
with automatic air vent, pressure relief valve, and pressure gage
Ⓔ Expansion tank
Ⓖ Water chiller

IMPORTANT

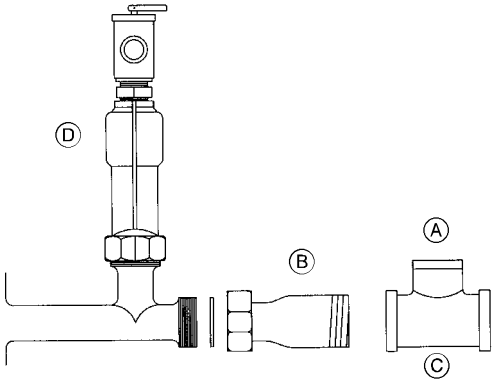
We strongly suggest that the valves pictured above be labelled "v1" and "v2".

IMPORTANT

In the above system, the circulating pump must be operated from a separate on/off switch - not from the pump aquastat on the boiler.

Installation Examples *(continued)*

Boiler with low water cut-off



Ⓐ Low water cut-off connection
Ⓑ Boiler supply (NPT) ..... ∅ 1½"
Ⓒ Tee (field supplied) ..... 1" x 1" x $^{3}/_{4}$"
Ⓓ Viessmann Safety Header

A low water cut-off may be required by local codes. If boiler is installed above radiation level, a low water cut-off device attached to Ⓐ of approved type (field supplied) must be installed in all instances. Do **not** install an isolation valve between boiler and low water cut-off.

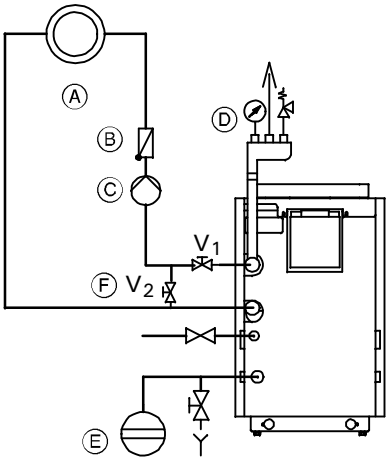
See piping to the left for detailed connection of low water cut-off. Follow the installation instructions of the low water cut-off manufacturer.

Installation Examples *(continued)*

Important precautions

Avoid frequent system water replenishment

This boiler is **not** for use in systems where water is constantly or frequently replenished. Minerals such as calcium in make-up water can deposit on the heat exchanger causing overheating, and eventually the boiler will leak. This type of failure is not covered by warranty. Water must not be drained from system for use by cleaning personnel or be constantly replenished due to inadequately sized expansion tanks, flooded expansion tanks, system leaks, etc.



Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Safety header with automatic air vent, pressure relief valve, and pressure gage
Ⓔ Expansion tank
Ⓕ Bypass (must be min. 12″/305 mm long)
V_1 Flow regulating/throttling valve
V_2 Flow regulating/throttling valve

Oxygen diffusion barrier underfloor tubing

The boiler warranty does **not** cover leaks resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier. Such systems must have non-oxygen-diffusion barrier tubing separated from the boiler with a heat exchanger. Viessmann recommends the use of underfloor plastic tubing with an oxygen diffusion barrier.

Supply/return bypass for large water content systems

For boilers connected to large water content systems, such as a previous gravity system with large free-standing radiators, a bypass line from the supply pipe to the return pipe can be used. Bypass can be installed on any system as a preventative measure. **Viessmann strongly recommends installing a bypass pipe on all cast iron boilers.**

Install bypass as shown in order to prevent condensation from occurring in the heat exchanger when installing the boiler in a large water volume residential system (typically systems with volume > 1 USG/3.8 ltr for every 13 000 Btu/h).

Install supply/return bypass as follows:

1. Install full size bypass pipe (same diameter as boiler supply and return pipes) as shown.
2. Install two flow regulating/throttling valves, V_1 and V_2, to slow down the flow in the boiler by bypassing some of the water back to the system.
3. Bypass pipe must be at least 12″/305 mm long.
4. Open valve V_1 and close valve V_2 completely.
5. By trial and error method, gradually open valve V_2 while regulating valve V_1 until the boiler temperature gage reads at least 140 °F/60 °C in less than ten minutes.

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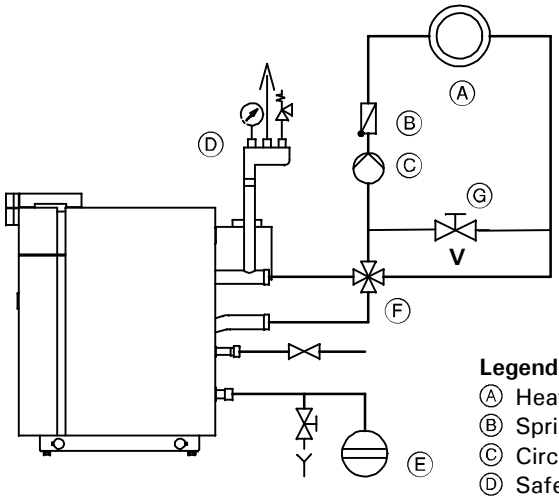
Installation Examples *(continued)*

Important precautions (continued)



Legend:
- Ⓐ Heating circuit
- Ⓑ Spring-loaded flow check valve
- Ⓒ Circuit pump
- Ⓓ Safety header with air vent, pressure relief valve and pressure gage
- Ⓔ Expansion tank
- Ⓕ 4-Way mixing valve
- Ⓖ Bypass pipe with flow regulating valve, for systems with large water content (>1 USG/13 000 Btu/h / 15 ltr/kW/h of boiler input).

Supply/return bypass for large water content systems with mixing valve

Install supply/return bypass as follows:

1. Install full size bypass pipe (same diameter as boiler supply and return pipes) as shown.
2. Install a flow regulating/throttling valve "V" to slow down the flow in the boiler by bypassing some of the water back to the system (approx. 30% to 50%of the total flow).
3. Bypass pipe must be at least 12"/305 mm in length.
4. By trial and error method, regulate valve "V" until the boiler temperature gage reads at least 140 °F/60 °C in less than ten minutes.

Combustion Air Supply

This boiler requires fresh air for safe operation and must be installed ensuring there are provisions for adequate combustion and ventilation air.

Provisions for combustion and ventilation air must be made in accordance with applicable local codes. In the absence of local codes, use CAN/CSA-B149.1 or .2 Installation Codes for Gas Burning Appliances for Canada. For U.S. installations use section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code ANSI Z223.1. Always use latest editions of codes.

Whenever possible, install boiler near an outside wall so that it is easy to duct fresh air directly to the boiler area. Refer to national codes for duct sizing and allowable lengths. Round ducts can be used.

WARNING

Failure to provide an adequate supply of fresh combustion air can cause poisonous flue gases to enter living space which can cause severe personal injury or loss of life.

WARNING

Never cover the boiler or store debris or other materials near the boiler, or in any way block the flow of adequate fresh air to the boiler. Never cover the combustion air opening or put anything inside draft hood. Advise system operator/ ultimate owner accordingly.

The boiler location must never be under negative pressure. Exhaust fans, attic fans, or dryer fans may cause air to be exhausted at a rate higher than air can enter the structure for safe combustion.

WARNING

The boiler must not be located in areas or rooms where chemicals are stored, or aggressive vapors (i.e. bleach, hair spray, methyl chloride, carbon tetrachloride or perchloroethylene) or high dust levels or humidity levels are present. Heat exchanger corrosion might occur and reduce the lifetime of the boiler significantly. If above criteria are not properly observed and boiler damage results, any warranty on the complete boiler and related components will be null and void.

Combustion Air Supply *(continued)*

Louvres and grilles

In calculating free area as specified on page 29 and 30, consideration shall be given to the blocking effect of louvers, grilles, or screens that protect openings. Screens used shall be not smaller than ¼" / 6 mm mesh and shall be readily accessible for cleaning. If the free area through a design of louvre or grille is known, it shall be used in calculating the size of opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvres have 20-25% free area and metal louvres and grills have 60-75% free area.

Combustion air opening

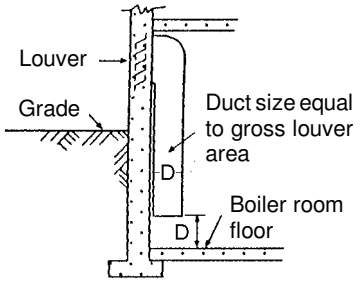
Install a combustion air opening. Ensure the following requirements are met:

Boiler Model	Model No.	GS1-22	GS1-29	GS1-35	GS1-42	GS1-48	GS1-60
Opening/duct diameter (free area)	inches	4	4	5	6	6	7

1. Size combustion air opening according to chart above.

2. Corrosion resistant screens must not have individual grids less than ¼" x ¼" / 6 mm x 6 mm. Screens or louvers must not reduce the free area required for combustion air. Increase duct diameter if louvers are used.

3. A combustion air opening from the outdoors shall be located not less than 12 inches / 30 cm above the outside grade.



Combustion air opening for below-grade boiler room

4. The outside inlet of the combustion air duct must not permit the entry of rain or wind and must not reduce the free are of the air. It must not be blocked by snow.

5. Manually operated combustion air dampers are **not** allowed. The air opening must not be of a type that could lead to situations where the air supply may be closed off while the burners are in operation.

6. If the combined MBH input exceeds 400 MBH for all gas burning appliances, the following excerpt from the CAN/CSA B-149 Code can be used:

Combustion air supply shall have a cross sectional area of not less than 100 inches^2 / 650 cm^2 plus 1 inch^2 / 6½ cm^2 for each 14 MBH in excess of 400 MBH. This/these opening(s) shall be either located at, or ducted to, a point neither more than 18 inches / 46 cm nor less than 6 inches / 16 cm above the floor level.

The heating contractor must check with local authorities (municipal building department, gas utility) for combustion air requirements particular to the area.

⚠ WARNING

Whenever your boiler is installed in a structure with airtight features such as weather stripping or tight insulation, there must be a combustion air opening installed to supply air from the outside even though the boiler may be installed in a space with a large volume relative to the boiler. Any building type and structure must be evaluated for proper and adequate combustion air supply before the boiler is put into operation.

Ventilation air opening

In addition to the combustion air opening, a ventilation air opening should be installed at the highest practical point communicating with the outdoors with a minimum area of 10% of the combustion air opening or 10 inches^2 / 65 cm^2, whichever is greater.

Post-Installation ...

Start-up information

Start-up/Service Instructions of boiler and control

Service Binder

1. File all Parts Lists, Operating and Service Instructions into the Service Binder.

2. Install a protective hanging case near the boiler and store the Service Binder in this location.

Technical Data

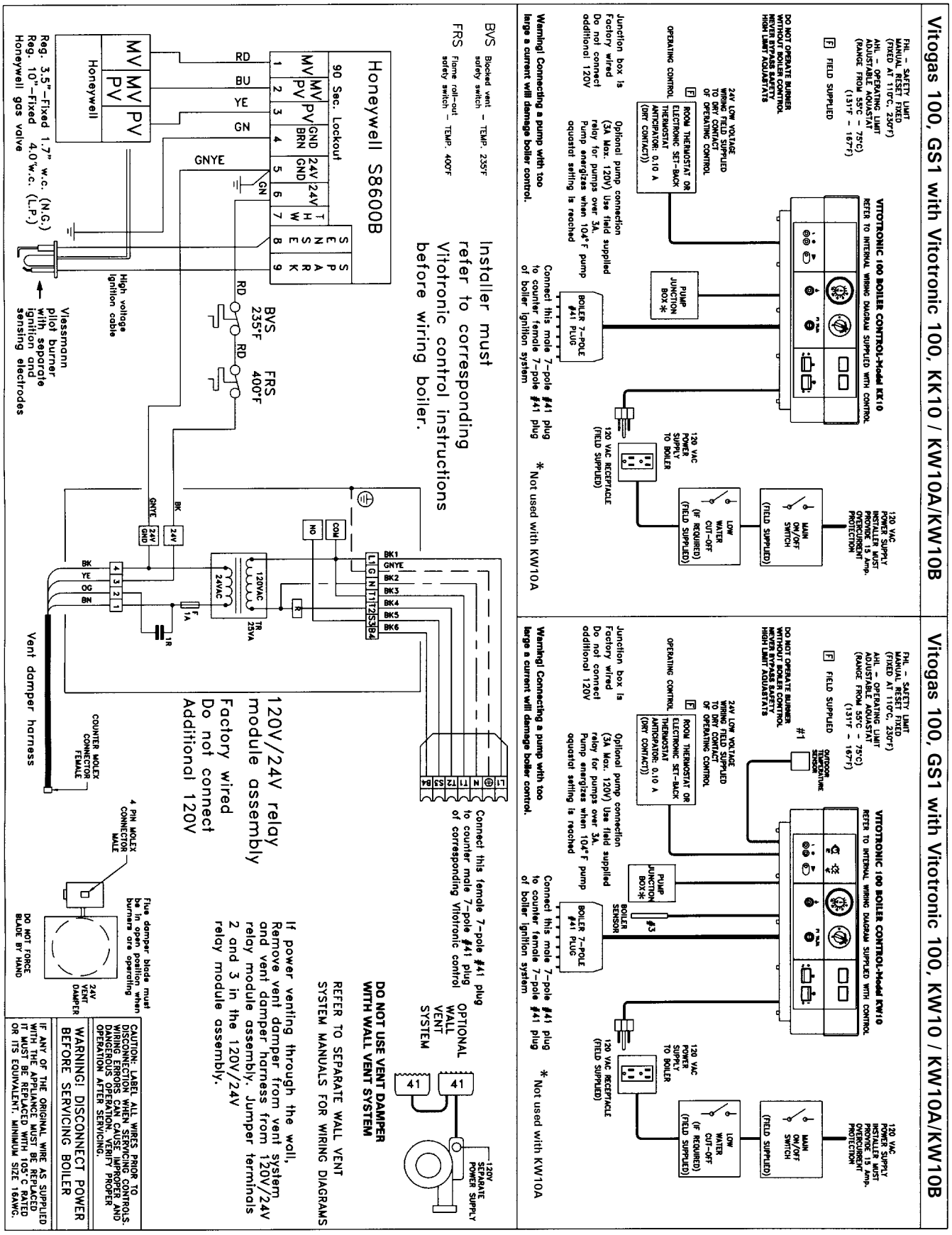
Boiler Model	Model No.	GS1-22	GS1-29	GS1-35	GS1-42	GS1-48	GS1-60
CSA input	MBH	90	115	145	165	190	240
	kW	26	34	42	48	56	70
CSA output	MBH	76	98	123	140	161	203
DOE heating capacity	kW	22	29	36	41	47	60
Min. gas supply pressure							
Natural gas	" w.c.	5	5	5	5	5	5
LPG	" w.c.	11	11	11	11	11	11
Max. gas supply pressure[*1] **(flow)**	" w.c.	14	14	14	14	14	14
Max. operating pressure (water)	psig	60	60	60	60	60	60
Boiler connections							
Boiler supply and return	Ø" (male thread)	1½	1½	1½	1½	1½	1½
Safety supply	Ø" (male thread)	1½	1½	1½	1½	1½	1½
Drain valve	Ø" (male thread)	¾	¾	¾	¾	¾	¾
Gas supply connection	Ø" (tapered male thread)	½	½	½	½	½	½
Flue gas[*2]							
Temperature (gross)	°F	223	216	235	266	228	252
	°C	106	102	113	130	109	122
Mass flow rate							
– with natural gas	lbs/h	161	216	236	231	342	353
	kg/h	73	98	107	105	155	160
– with LPG	lbs/h	148	209	209	223	322	337
	kg/h	67	95	95	101	146	153
Vent pipe collar	**outside Ø"**	5	6	6	6	7	7

*[*1] If the gas supply pressure is higher than the maximum permissible value, a separate gas regulator must be installed upstream of the boiler system.*

*[*2] Measured flue gas temperature after dilution air with combustion air temperature of 68°F / 20°C.*

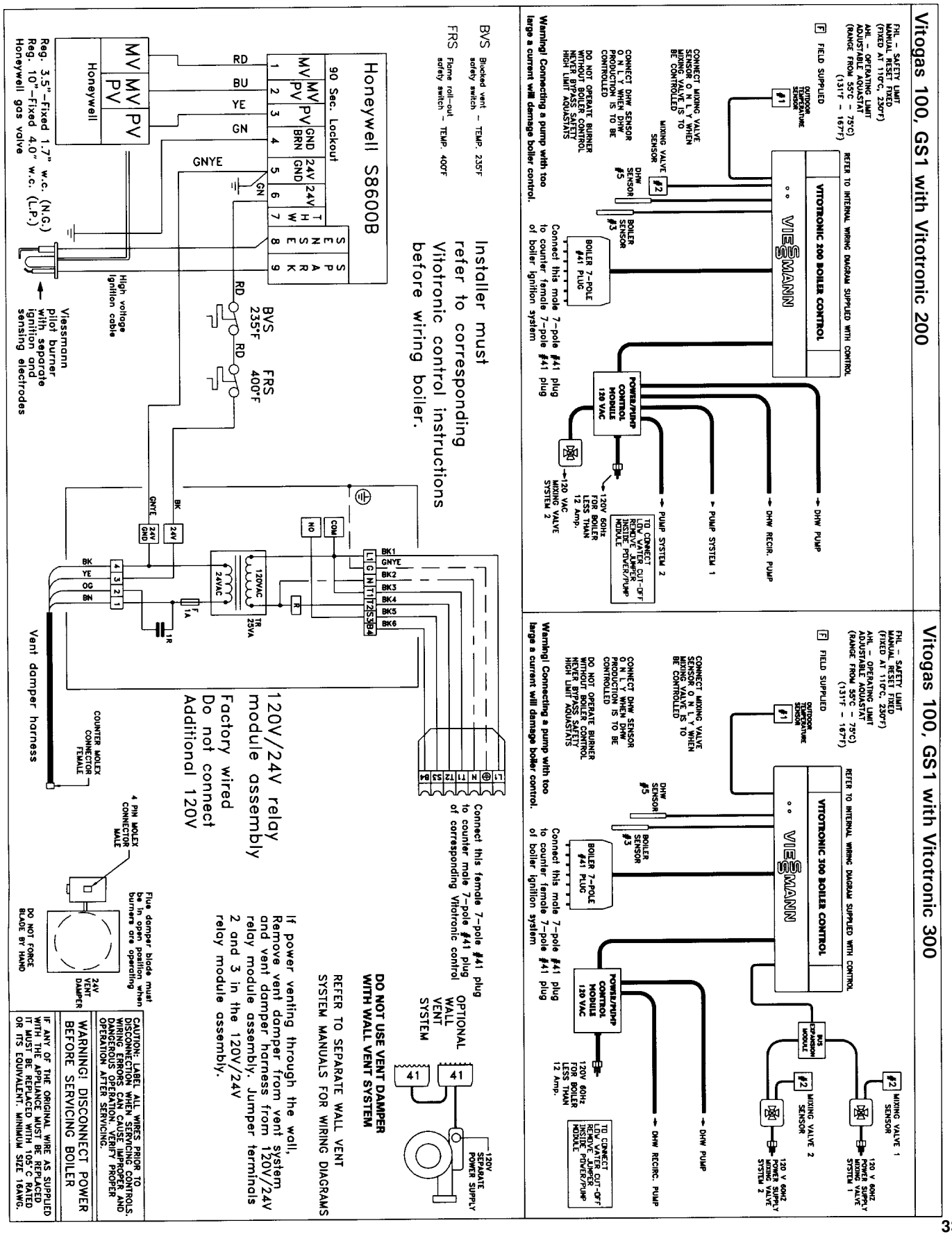
Vitogas 100, GS1 with Vitotronic 100 Controls

Please refer to wiring label on boiler access panel. Viessmann reserves the right to substitute components or wiring methods. Boiler wiring label takes precedence.


Vitogas 100, GS1 with Vitotronic 100, KK10 / KW10A/KW10B
Vitogas 100, GS1 with Vitotronic 100, KW10 / KW10A/KW10B
VITOTRONIC 100 BOILER CONTROL-Model KK10
VITOTRONIC 100 BOILER CONTROL-Model KW10
REFER TO INTERNAL WIRING DIAGRAM SUPPLIED WITH CONTROL
LIM - SAFETY LIMIT MANUAL RESET FIXED (FIXED AT 110°C, 230°F)
AHL - OPERATING LIMIT ADJUSTABLE AQUASTAT (RANGE FROM 55°C - 75°C) (131°F - 167°F)
F FIELD SUPPLIED
DO NOT OPERATE BURNER WITHOUT BOILER CONTROL NEVER BYPASS SAFETY HIGH LIMIT AQUASTATS
24V LOW VOLTAGE WIRING FIELD SUPPLIED TO MAKE CONTACT OF OPERATING CONTROL
ROOM THERMOSTAT OR ELECTRONIC SET-BACK THERMOSTAT ANTICIPATOR: 0.10 A (DRY CONTACT))
OPERATING CONTROL
Junction box is Factory wired Do not connect additional 120V
Optional pump connection (3A Max. 120V) Use field supplied relay for pumps over 3A. Pump energizes when 104°F pump aquastat setting is reached
Warning! Connecting a pump with too large a current will damage boiler control.
Connect this male 7-pole #41 plug to counter female 7-pole #41 plug of boiler ignition system
BOILER 7-POLE #41 PLUG
PUMP JUNCTION BOX*
BOILER SENSOR
#3
#1
OUTDOOR TEMPERATURE SENSOR
120 VAC POWER SUPPLY INSTALLER MUST PROVIDE 15 Amp. OVERCURRENT PROTECTION
MAIN ON/OFF SWITCH (FIELD SUPPLIED)
LOW WATER CUT-OFF (IF REQUIRED) (FIELD SUPPLIED)
120 VAC POWER SUPPLY TO BOILER
120 VAC RECEPTACLE (FIELD SUPPLIED)
*Not used with KW10A
Honeywell S8600B
90 Sec. Lockout
SENSOR
THERMOSTAT
MV PV GND 24V
RD BU YE GN GNYE
Honeywell
MV PV
Reg. 3.5"–Fixed 1.7" w.c. (N.G.) Reg. 10"–Fixed 4.0"w.c. (L.P.) Honeywell gas valve
High voltage ignition cable
Viessmann pilot burner with separate ignition and sensing electrodes
BVS Blocked vent safety switch – TEMP: 235°F
FRS Flame roll-out safety switch – TEMP: 400°F
BVS 235°F
FRS 400°F
Installer must refer to corresponding Vitotronic control instructions before wiring boiler.
BK1 GNYE BK2 BK3 BK4 BK5 BK6
L1 G N T1 T2 S3 S4
Connect this female 7-pole #41 plug to counter male 7-pole #41 plug of corresponding Vitotronic control
OPTIONAL WALL VENT SYSTEM
41
120V SEPARATE POWER SUPPLY
DO NOT USE VENT DAMPER WITH WALL VENT SYSTEM
REFER TO SEPARATE WALL VENT SYSTEM MANUALS FOR WIRING DIAGRAMS
120V/24V relay module assembly
Factory wired Do not connect Additional 120V
If power venting through the wall, Remove vent damper from vent system and vent damper harness from 120V/24V relay module assembly. Jumper terminals 2 and 3 in the 120V/24V relay module assembly.
Vent damper harness
COUNTER MOLEX CONNECTOR FEMALE
4 PIN MOLEX CONNECTOR MALE
24V VENT DAMPER
Flue damper blade must be in open position when burners are operating
DO NOT FORCE BLADE BY HAND
CAUTION: LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. VERIFY PROPER OPERATION AFTER SERVICING.
WARNING! DISCONNECT POWER BEFORE SERVICING BOILER
IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED IT MUST BE REPLACED WITH 105°C RATED OR ITS EQUIVALENT. MINIMUM SIZE 16AWG.

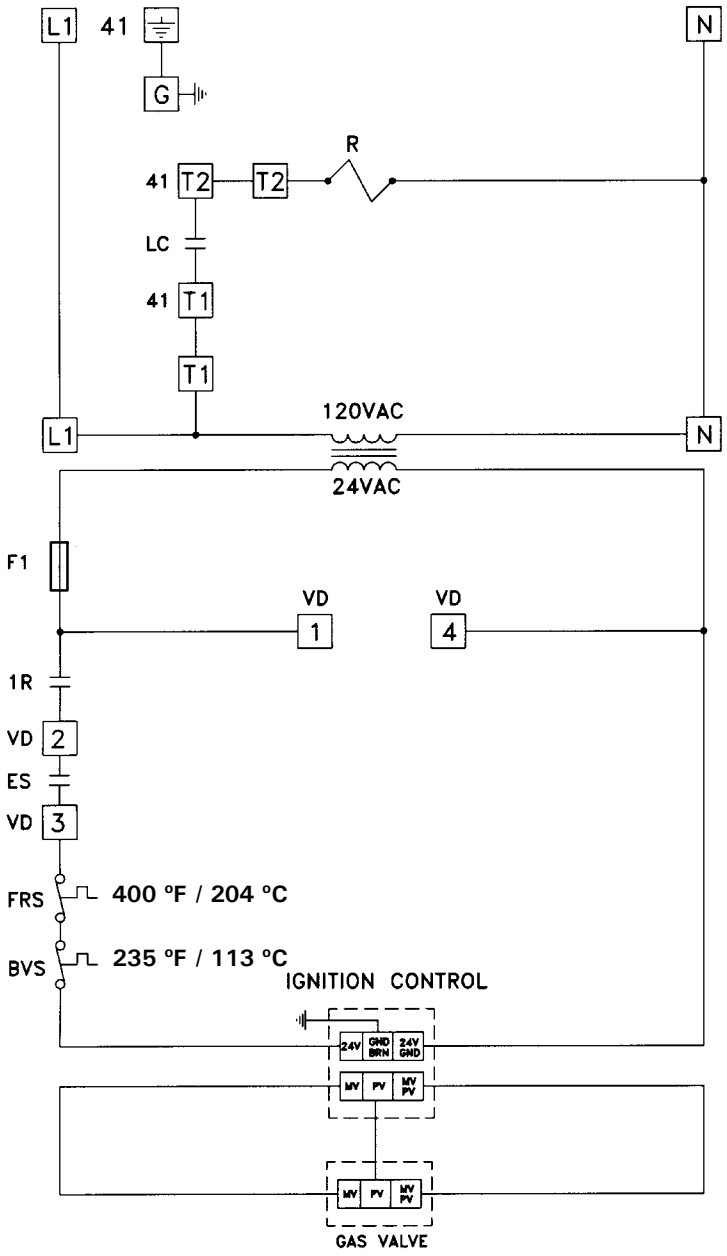
Vitogas 100, GS1 with Vitotronic 200 and 300 Controls

Please refer to wiring label on boiler access panel. Viessmann reserves the right to substitute components or wiring methods. Boiler wiring label takes precedence.


Vitogas 100, GS1 with Vitotronic 200
FHL - SAFETY LIMIT MANUAL RESET FIXED (FIXED AT 110°C, 230°F)
AHL - OPERATING LIMIT ADJUSTABLE AQUASTAT (RANGE FROM 55°C - 75°C) (131°F - 167°F)
F FIELD SUPPLIED
#1 OUTDOOR TEMPERATURE SENSOR
REFER TO INTERNAL WIRING DIAGRAM SUPPLIED WITH CONTROL
VITOTRONIC 200 BOILER CONTROL
VIESMANN
CONNECT MIXING VALVE SENSOR ONLY WHEN MIXING VALVE IS TO BE CONTROLLED
#2 MIXING VALVE SENSOR
DHW SENSOR #5
BOILER SENSOR #3
CONNECT DHW SENSOR ONLY WHEN DHW PRODUCTION IS TO BE CONTROLLED
DO NOT OPERATE BURNER WITHOUT BOILER CONTROL NEVER BYPASS SAFETY HIGH LIMIT AQUASTATS
Warning! Connecting a pump with too large a current will damage boiler control.
BOILER 7-POLE #41 PLUG
Connect this male 7-pole #41 plug to counter female 7-pole #41 plug of boiler ignition system
POWER/PUMP CONTROL MODULE 120 VAC
120V 60Hz FOR BOILER LESS THAN 12 Amp.
120 VAC MIXING VALVE SYSTEM 2
TO CONNECT LOW WATER CUT-OFF REMOVE JUMPER INSIDE POWER/PUMP MODULE
DHW PUMP
DHW RECIR. PUMP
PUMP SYSTEM 1
PUMP SYSTEM 2
Vitogas 100, GS1 with Vitotronic 300
MIXING VALVE 1 SENSOR
120 V 60HZ POWER SUPPLY MIXING VALVE SYSTEM 1
MIXING VALVE 2 SENSOR
120 V 60HZ POWER SUPPLY MIXING VALVE SYSTEM 2
MM EXPANSION MODULE
Honeywell S8600B
90 Sec. Lockout
BVS Blocked vent safety switch - TEMP. 235°F
FRS Flame roll-out safety switch - TEMP. 400°F
Installer must refer to corresponding Vitotronic control instructions before wiring boiler.
RD BU YE GN GNYE
Honeywell MV PV
Reg. 3.5"-Fixed 1.7" w.c. (N.G.) Reg. 10"-Fixed 4.0" w.c. (L.P.) Honeywell gas valve
High voltage ignition cable
Viessmann pilot burner with separate ignition and sensing electrodes
BVS 235°F
FRS 400°F
BK YE OG BN
24V GND
120VAC 24VAC TR 25VA
1A 1R
Vent damper harness
COUNTER MOLEX CONNECTOR FEMALE
4 PIN MOLEX CONNECTOR MALE
24V VENT DAMPER
Flue damper blade must be in open position when burners are operating
DO NOT FORCE BLADE BY HAND
Connect this female 7-pole #41 plug to counter male 7-pole #41 plug of corresponding Vitotronic control
OPTIONAL WALL VENT SYSTEM
120V SEPARATE POWER SUPPLY
DO NOT USE VENT DAMPER WITH WALL VENT SYSTEM
REFER TO SEPARATE WALL VENT SYSTEM MANUALS FOR WIRING DIAGRAMS
120V/24V relay module assembly
Factory wired
Do not connect Additional 120V
If power venting through the wall, Remove vent damper from vent system and vent damper harness from 120V/24V relay module assembly. Jumper terminals 2 and 3 in the 120V/24V relay module assembly.
CAUTION: LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. VERIFY PROPER OPERATION AFTER SERVICING.
WARNING! DISCONNECT POWER BEFORE SERVICING BOILER
IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED IT MUST BE REPLACED WITH 105°C RATED OR ITS EQUIVALENT. MINIMUM SIZE 16AWG.

5167 463 v1.3

Vitogas 100, GS1 Ladder Diagram of Ignition System



Legend

41	**Terminals in plug** 41
R	**Relay coil 1**
1R	**Contact of relay 1**
LC	**Limit contact in boiler control**
T	**120 V / 24V, class II transformer**
F1	**Fuse (slow blow)**
VD	**Vent damper**
ES	**End switch in vent damper**
FRS	**Flame roll-out switch**
BVS	**Blocked vent switch**
L1	**120 V (hot)**
N	**120 V (neutral)**

- Demand for heat causes vent damper blade to open, closing vent damper end switch ES. 120 V is available to transformer.
- Ignition module is energized with 24 V from the 24 V transformer.
- Pilot valve is energized with 24 V. Pilot sparks and pilot gas flows. Once pilot proves, 24 V is applied to “MV/PV” and “MV” energizing main valve.
- Burner cycles on and off in response to operating control (room thermostat, end switch of zone valve, separate indoor/outdoor reset control).
- Ignition system can cycle off adjustable high limit aquastat in boiler control during a demand for heat.
- BVS (blocked vent switch) or FRS (flame roll-out switch) can de-energize ignition system.

Vitotronic boiler controls and Vitogas 100, GS1 Service Instructions

Printed on environmentally friendly (recycled and recyclable) paper.

Technical information subject to change without notice.

5167 463 v1.3

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